Software Communications Architecture (SCA) Next CORBA Profiles

This document includes a list of proposed CORBA profile(s) from the CORBA/e specification[1] to be used in SCA Next. This list is a working product for the SCA Next development and should be used for reference only.

Additional information regarding the SCA Next CORBA Evolution task[2] can be found on the Joint Program Executive Office (JPEO) Joint Tactical Radio System (JTRS) Standards Website: http://sca.jpeojtrs.mil/.

The following symbols are used in the table:
F= Full, L=Lightweight, o=omit, R=Restriction, E=Extension

On most SCA platforms, waveforms shall use only CORBA features marked with the symbol 'F'. On extremely limited platforms, implementing only lightweight components, waveforms shall use on CORBA features marked with 'L'. General platforms shall support all features marked with the symbol 'F', but may support additional features and may require additional features to fully support Core Framework or to improve performance.

[1] Object Management Group, " Common Object Request Broker Architecture (CORBA) for embedded Specification, Version 1.0, November 2008, Available: http://www.omg.org/spec/CORBAe/1.0/PDF
[2] JTRS Standards, "SCA Next Roll-out Briefings: 113 CORBA Evolution", Available: http://sca.jpeojtrs.mil/_downloads.asp?folder=scanext&file=113CORBAEvolution.pdf

Module	CORBA Interface	Operation/Feature	CORBA/e para #	SCA profiles	Minimum CORBA	CORBA/e Compact	CORBA/e Micro	F diffs from Min CORBA (SCA 2.2.2)	F diffs from Compact	Comments
CORBA	**IDL**	Abstract Interfaces	5.3.9	o	x			R		
		Value Type	5.3.8	o	x	x		R	R	value Types added in CORBA 2.3, Custom Value Types, value box and inheritance value excluded for compact
		any	6.10.1.7	F	x	x				configure/query/test/capacities
		operation context clauses	6.12.4	o	x			R		import added in CORBA 3.0
		boolean, octet, short, unsigned short, long, unsigned long, enum	6.10.1	FL						
		float, double, long double, long long, unsigned long long, char, string	6.10.1	FL*						* allowed in L but discouraged to improve portability and data transfer with FPGAs using CORBA or non-CORBA APIs.
		wide character/string	6.10.1.4, 6.10.3.3	o	x	x	x	R	R	support is tested by JTAP but not in POSIX 51,52, and 53 profiles
		unions	6.10.2.2	FL*	x	x	x			widely used in APIs, * allowed in L but discouraged to improve portability and data transfer with FPGAs using CORBA or non-CORBA APIs.
		arrays	6.10.4.1	FL*	x	x	x			used in APIs, * allowed in L but discouraged to improve portability and data transfer with FPGAs using CORBA or non-CORBA APIs
		struct	6.10.2.1	FL	x	x	x			required by domain profile and APIs, shall only contain base types allowed by profile

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		sequence	6.10.3.1	FL	x	x	x			required by domain profile and APIs, shall only contain base types allowed by profile
		import	table 6.1	o						CORBA 3.0 feature, not in 2.x
	ORB	orb_init	8.3.1	FL	x	x	x	E	E	client/server component main/thread. Additional standardized arguments shall be supported order to support persistence and id assignment policy in the rootPOA.
		id	8.2.1.1	o	x	x	x			
		object_to_string	8.2.2.1	FL	x	x	x			to be able to pass an object reference as string as an entry point's arg
		string_to_object	8.2.2.2	FL	x	x	x			server component main/thread to be able to register to component, device mgr, domain mgr, naming service; persistent object references
		get_service_information	8.2	o	x	x	x	R	R	
		list_initial_services	8.3.2.1	o	x	x	x	R	R	
		resolve_initial_references	8.3.2.2	F	x	x	x			server component main/thread to be able to obtain RootPOA. Not all IDs have to be supported, NamingService unless replace with DomainManager
		work_pending	8.2.3.1	FL		x	x	E		single-threaded servers
		perform_work	8.2.3.2	FL		x	x	E		single-threaded servers
		run	8.2.3.3	FL	x	x	x			for main programs
		shutdown	8.2.3.4	FL		x	x	E		releaseObject behavior associated with main program
		destroy	8.2.3.5	FL	x	x	x			clean up

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		create_policy	10.2.2.3	F	x	x				manage ORB
		register_value_factory	8.2, 9.3.3.3	o	x	x		R	R	
		unregister_value_factory	8.2, 9.3.3.3	o	x	x		R	R	
		lookup_value_factory	8.2, 9.3.3.3	o	x	x		R	R	
		register_initial_reference	8.3.3.1	o	x	x		R	R	platform but not waveform
	Object	get_interface	11.3.1	o	x	x	x	R	R	
		is_nil	9.2.3.1	F	x	x	x			register behavior checks
		duplicate	9.2.2.1	F	x	x	x			to return an object reference (e.g., port, application)
		release	9.2.2.2	F	x	x	x			unregister behavior, application teardown
		is_a	9.2.4.1	F		x	x	E		check for certain type
		non_existent	9.2.5.1	F		x	x	E		register device behavior checks
		is_equivalent	9.2.6.2	F	x	x	x			compare references
		hash	9.2.6.1	o	x	x	x	R	R	used by is_equivalent, not needed by waveform
		get_policy	9.2.8.1	F	x	x	x			support policies
		set_policy_overrides	9.2.9.1	F	x	x	x			support policies
		get_client_policy	9.2.8.2	F	x	x	x			support policies
		get_policy_overrides	9.2.8.3	F	x	x	x			support policies
		validate_connection	9.2.10.1	FL	x	x	x			required for GIOP behavior
		get_orb	9.2.11.1	F	x	x	x			access features requiring orb ref
		get_component		o	x			R		
	Policy	policy_type	10.2.1.3	F	x	x	x			support policies
		copy	10.2.1.1	F	x	x	x			support policies

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		destroy	10.2.1.2	F	x	x	x			clean up created policies no longer needed after poa creation
	PolicyManager	get_policy_overrides	10.3.3.1	F		x	x	E		support policies
		set_policy_overrides	10.3.3.2	F		x	x	E		support policies
	TypeCode		8.5	F	x	x				extract from any, but do NOT need value support
	PolicyCurrent		10.3.3.2	F		x	x	E		support policies
Messaging	**RebindPolicy**	rebind_mode	10.4.1.2	o		x	x		R	extends Policy interface
	SyncScopePolicy	synchronization	10.4.2	F		x	x	E		extends Policy interface
	RequestEndTimePolicy	end_time	10.4.3.1	o		x	x		R	extends Policy interface, CORBA Time Service
	ReplyEndTimePolicy	end_time	10.4.3.2	o		x	x		R	extends Policy interface, CORBA Time Service
	RelativeRequestTimeoutPolicy	relative_expiry	10.4.3.3	o		x	x		R	extends Policy interface - useful but expensive
	RelativeRoundtripTimeoutPolicy	relative_expiry	10.4.3.4	o		x	x		R	extends Policy interface, for compact RTCORBA - useful but expensive
PortableServer	**LifespanPolicy**	value	11.3.3.1	F	x	x				for persistent objects (e.g., static delpoyment, platform services, etc.)
	IdUniquenessPolicy	value	11.3.3.1	o	x	x		R	R	
	IdAssignmentPolicy	value	11.3.3.1	F	x	x				control the well defined obect IDs for platform services
	POAManager	activate	11.3.2.2	FL	x	x	x			to receive requests
		get_state	11.3.2.3	o		x	x		R	
		get_id	11.4.1	F		x	x	E		dequeuing requests

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	POA	create_POA	11.3.4.1	F	x	x				would be needed for RTCORBA, and persistent lifecycle and ID policies
		find_POA	11.3.4.2	F	x	x				manage sub POAs
		destroy	11.3.4.3	F	x	x	x			manage sub POAs
		create_lifespan_policy	11.3.5	F	x	x				for persistent objects (e.g., static delpoyment, platform services, etc.)
		create_id_uniqueness_policy	11.3.5	F	x	x				manage sub POAs
		create_id_assignment_policy	11.3.5	F	x	x				control the well defined obect IDs for platform services
		the_name	11.3.5.1	F	x	x	x why ?			manage sub POAs
		the_parent	11.3.5.2	F	x	x	x why ?			manage sub POAs
		the_POAManager	11.3.5.3	FL	x	x	x			retrieve poa mgr for activation
		activate_object	11.2.5.4	FL	x	x	x			Platform and application components
		activate_object_with_id	11.3.5.5	FL	x	x				Platform and Application components to support persistent objects
		deactivate_object	11.3.5.6	FL	x	x	x			application components
		create_reference	11.2.9	F	x	x	x			static IOR
		create_reference_with_id	11.2.9	F	x	x	x			
		servant_to_id	11.3.5.7	F	x	x	x			
		servant_to_reference	11.3.5.8	F	x	x	x			static IOR
		reference_to_servant	11.3.5.9	F	x	x	x			static IOR
		reference_to_id	11.3.5.10	F	x	x	x			

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		id_to_servant	11.3.5.11	F	x	x	x			
		id_to_reference	11.3.5.12	F	x	x	x			
	Current	get_POA	11.3.6.1	F	x	x	x			Used to get current POA during deactivation
		get_object_id	11.3.6.2	F	x	x	x			Used during App, DeviceMgr, Device & File Object deactivation
		get_reference	11.3.6.3	F		x	x	E		manage references
		get_servant	11.3.6.4	F		x	x	E		manage references
RTCORBA	**ServerProtocolPolicy ClientProtocolPolicy**		A.4	F				E	E	profiles should probably provide a mechanism to control which transports client and servers use e.g, make use of RTCORBA:ServerProtocolPolicy and RTCORBA:ClientProtocolPolicy
	PriorityModelPolicy	CLIENT_PROPAGATED	12.7.2	F		x		E		manage priorities
		SERVER_DECLARED	RTCORBA.idl	F				E	E	manage priorities, less to propogate
	PriorityBandedConnectionPolicy	priority_bands	12.1	F		x		E		needs discussion on expense, allow but warn about costs and to use sparingly
	Current	the_priority	12.12	F		x		E		manage priorities
	Mutex	lock	12.8	o		x	x		R	ORB's internal use of mutex shall not conflict with clients using posix mutex
		unlock	12.8	o		x	x		R	
		try_lock	12.8	o		x	x		R	
	RTORB	create_mutex	12.8	o		x	?		R	
		destroy_mutex	12.8	o		x	?		R	
		create_priority_model_policy	12.7.1	F		x		E		manage priorities

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		create_priority_banded_connection_policy	12.10	F		x		E		manage priorities
	Thread Pools	create_threadpool	RT 2.10	F						
		create_threadpool_with_lanes	RT 2.10	F				E	E	Threadpools useful for creating multi priority aware servers but not currently supported by CORBA/e
RTPortableServer	**POA**	activate_object_with_priority	RT 2.7.5	F				E	E	manage rt priorities
CosNaming	**NamingContext**		13.2	o		x	x		R	only needed if naming service remains, why not LW Services?
	BindingIterator		13.3	o		x	x		R	
	NamingContextExt		13.5.4	o		x	x		R	
CosEventComm	**PushConsumer**		14.1.6.1	F		x	x	E		optional service in SCA - application may use but must behave well when it does not exist.
	PushSupplier		14.1.6.1	F		x	x	E		optional service in SCA - application may use but must behave well when it does not exist.
	PullSupplier		14.1.6.2	o		x	x		R	pull model not needed
	PullConsumer		14.1.6.2	o		x	x		R	pull model not needed
CosEventChannelAdmin	**ProxyPushConsumer**		14.4	o		x	x		R	
	ProxyPushSupplier		14.4	o		x	x		R	
	ProxyPullConsumer		14.4	o		x	x		R	

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	ProxyPullSupplier		14.4	o		x	x		R	
	ConsumerAdmin		14.4	o		x	x		R	
	SupplierAdmin		14.4	o		x	x		R	
	EventChannel		14.4	o		x	x		R	
LW Log Service			15	F		x	x	E		this does not contradict the SCA that does not require the platform to supply a LwLog
GIOP	**Connection Management**		16	o	x	x	x		R	consider ORB-independent standard for a lightweight GIOP
CDR Transfer Syntax			17	o	x	x	x		R	
GIOP Messages			18	o	x	x	x		R	
IIOP			19	o	x	x	x		R	